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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,170	01/24/2007	Sheng Liu	CU-4815 RJS	8931

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EXAMINER	
HARLEY, JASON A	

ART UNIT	PAPER NUMBER
2468	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/579,170	LIU ET AL.	
	Examiner	Art Unit	
	Jason Harley	2468	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *2,4, 5, 12, 13, 14,15, 16* is/are rejected.

7)☐ Claim(s) *3,6-11,17 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 January 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/05/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This communication is in response to the application filed on 1/24/07 in which claims 1-20 are presented for examination.

Claim Objections

1. Claim5 objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claim 5 not been further treated on the merits. Claim 5 is improper because it depends on claim 1, 2, and 3.

2. Claims 3, 6-11, 17, 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornberg et al. U.S. Patent No. (5,757,772) in view of Holma U.S. PG Pub No. (2005/0099961).

As to claim 1, Thornberg teaches a method for performing packet combined scheduling of dedicated transport channels for packet services in UMTS downlinks, wherein dedicated traffic channels (DTCHs) in logical channels are mapped as dedicated channels (DCHs) in transport channels, and N DCHs, in their respective input queues, queue up for being transported to the corresponding M DPCHs, where M ≤N, the method being characterized in that the method for performing packet combined scheduling of the DCHs comprises the following steps (Thornberg, col 1, ln 48-54, 58-64, col 2, ln 48-56, 65-67, col 3, ln 1-5,). The columns show packet timing of transport channels for packet services in UMTS downlinks wherein channels radio channel traffic supervision function is provided for each channel. The traffic is shown to not exceed the amount of channels.

Thronberg show c) based on the fairness of DCH transportation and the QoS requirements of the DCH-borne services, determining weighted values which the respective DCHs correspond to in the optimization of the DCH combined packet scheduling (Thornton, col 14, ln 54-65). The column show determining weight values for for the traffic channels.

Thornberg disclose d) based on the results of steps a), b), and c), calculating the maximum number of bit(s) which each DCH is schedulable to output, using a 0-1 programming algorithm (Thornton, col 7, ln 45-52). The column show determining a max number of bits of the channel output.

Thornberg fails to show a) prior to each DCH scheduling period, performing pre-selection processing of a transport format combination of each DPCH according to the predetermined restriction conditions for the DCH combined packet scheduling, so as to determine a usable transport format combination set $TFCS_m$ for each DPCH and b) restricting a total downlink transmit power $\sum P_{k,n}$ of DCHs for NRT packet services to a schedulable power not exceeding a schedulable power in the estimation of a total downlink power during said scheduling period, i.e., the maximum allowable power value P_k, where P_{KN} denotes an average transmit power required by the N-th DCH in the k-th scheduling period, and.P_k denotes the maximum allowable power allocated to the DCHs which bear NRT packet services in the estimation of downlink power in the k-th scheduling period.

In analogous art Holma show a) prior to each DCH scheduling period, performing pre-selection processing of a transport format combination of each DPCH according to the predetermined restriction conditions for the DCH combined packet scheduling, so as to determine a usable transport format combination set $TFCS_m$ for each DPCH (0025, 0081, 0150) and b) restricting a total downlink transmit power $\sum P_{k,n}$ of DCHs for NRT packet services to a schedulable power not exceeding a schedulable power in the estimation of a total downlink power during said scheduling period, i.e., the maximum

allowable power value P_k , where P_{KN} denotes an average transmit power required by the N-th DCH in the k-th scheduling period, and.P_k denotes the maximum allowable power allocated to the DCHs which bear NRT packet services in the estimation of downlink power in the k-th scheduling period (par 0051, 0035). The paragraphs show performing a transport format combination set, and controlling power for packet sevices.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Thornberg and Holma because transport format combination combines information from different transport channels and controlling power allows for a dynamic change in the rate so services is schedulable.

As to claim 12, Thornton and Holma disclose the method as defined in claim 1, characterized in that steps a), b) and c) are executed in a parallel way (Thornton, col 4, ln 56-62). The column shows the controlling the access and data transfer can be done simultaneously.

As to claim 13, Thornton and Holma define the method as defined in claim 1, characterized in that the scheduling period is the frame length of a physical channel (Thornton, col 13, ln 36-45). The column shows the scheduling period is the frame length of a physical channel.

Claim Rejections - 35 USC § 103

5. Claims 2, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornberg et al. U.S. Patent No. (5,757,772), Holma U.S. PG Pub No. (2005/0099961) in view Rinne U.S. PG Pub No. (2005/0185651).

As to claim 2, Thornberg and Holma define the method as defined in claim 1, Thornberg and Holma fails to show characterized in that said determining the usable transport format combination set $TFCS_m$ for each DPCH according to the predetermined restriction conditions for the DCH combined packet scheduling in step a) further comprises: placing a high-priority packet at the front of an input buffer queue of a corresponding DCH; and performing the pre-selection processing on TFCS based on the TFCS of the DPCH, the activated DCH, and the length of the input queue of the DCH, thereby obtaining the Usable TFCS~) of each DPCH in the current scheduling period.

In an analogous art Rinne show characterized in that said determining the usable transport format combination set $TFCS_m$ for each DPCH according to the predetermined restriction conditions for the DCH combined packet scheduling in step a) further comprises: placing a high-priority packet at the front of an input buffer queue of a corresponding DCH (Rinne, par 0006, 0014, 0015, 0045, 0083); and performing the pre-selection processing on TFCS based on the TFCS of the DPCH, the activated DCH, and the length of the input queue of the DCH, thereby obtaining the Usable TFCSof each DPCH in the current scheduling period (Rinne, par 0006, 0083, 0123, 0124). The

paragraphs show determining priorities of packets of an input buffer of corresponding to a dedicated channel. It is also shown performing TFCS on dedicated channels and length of input queue.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Thornton , Holma, and Rinne because in order to reduce delay setting priority is needed and the TFCS selection is used to obtain usable TFCS of each channel.

As to claim 4, Thornberg, Holma, and Rinne provide the method as defined in claim 2, characterized in that the high-priority packet is a status Protocol Data Unit packet of a Radio Link Control layer of an Acknowledged Mode (Thornton, col 1, ln 23-27)

Claim Rejections - 35 USC § 103

6. Claim 5, 14, 16, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornberg et al. U.S. Patent No. (5,757,772), Holma U.S. PG Pub No. (2005/0099961) in view Paneth et al. U.S. PG Pub No. (2002/0021679).

As to claim 5, Thornberg and Holma create the method as defined in claim 1, 2 or 3, Thornton and Holma fails to show characterized in that said method further comprises,

prior to the pre-selection processing in step a), a step of performing DTCH scheduling allocation for the DCH by using the Round-Robin, WFQ or WF2Q scheduling algorithm.

In an analogous art Paneth show characterized in that said method further comprises, prior to the pre-selection processing in step a), a step of performing DTCH scheduling allocation for the DCH by using the Round-Robin, WFQ or WF2Q scheduling algorithm (Paneth, par 0229). The column shows using round robin scheduling.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Thornberg, Holma and Paneth because this allows different scheduling priorities to statistically multiplex data flows.

As to claim 14, Claim is a claim to an apparatus to carry out the method of claim 1. Therefore claim 14 is rejected under the same rationale set forth in claim1 an apparatus can be found in (Thornton, col 4, ln 1-5).

In analogous art Paneth show a power restriction proportional coefficient calculating unit for calculating a predicted/estimated value Ck,n of a proportional coefficient of an average transmit power ek., of the n-th DCH within the k-th scheduling period and the number of bit(s) ek.,which the DCH is schedulable to output within the scheduling period (Paneth, par 0066, 0506, 0507, 0509, 0511). The paragraphs show a linear prediction filter or estimating power coefficient for each channel.

As to claim 16, Thornton, Paneth, and Holma demonstrate the method as defined in claim 14, Thornton and Holma fails to show characterized in that said power l0 calculating unit further comprises: a linear prediction filter for estimating a power restriction proportional coefficient of each DCH in the current scheduling period based on a ratio of a measurement value of each DCH's actual transmit

In analogous art Paneth show characterized in that said power calculating unit further comprises: a linear prediction filter for estimating a power restriction proportional coefficient of each DCH in the current scheduling period based on a ratio of a measurement value of each DCH's actual transmit (Paneth, par 0066, 0506, 0507). The paragraphs show a linear prediction filter or estimating power coefficient for each channel.

As to claim 19, Claim 19 is a claim to an apparatus to carry out the method of claim 12. Therefore claim 19 is rejected under the same rationale set forth in claim 12.

As to claim 20, Claim 20 is a claim to an apparatus to carry out the method of claim 13. Therefore claim 20 is rejected under the same rationale set forth in claim 13

Claim Rejections - 35 USC § 103

7. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Thornberg et al. U.S. Patent No. (5,757,772), Holma U.S. PG Pub No. (2005/0099961), Paneth et al. U.S. PG Pub No. (2002/0021679) in view of Rinne U.S. PG Pub No. (2005/0185651).

As to claim 15, Thornton and Holma illustrate the apparatus as defined in claim 14, Thornton and Holma fails to show characterized in that the pre-selection processing unit further comprises: a DTCH scheduling module for executing a DTCH scheduled allocation of the DCH by using Round-Robin, WFQ or WF2Q scheduling algorithm;

In an analogous art Paneth show characterized in that said method further comprises, prior to the pre-selection processing in step a), a step of performing DTCH scheduling allocation for the DCH by using the Round-Robin, WFQ or WF2Q scheduling algorithm (Paneth, par 0229). The column shows using round robin.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Thornton, Holma and Paneth because this allows different scheduling priorities to statistically multiplex data flows.

Thornton, Holma, and Paneth fails to show a priority queuing module for putting a high-priority packets, such as a status PDU of a RLC of the AM, at the front of the input

buffer queue of the corresponding DCH; a TFCS pre-selection processing module for conducting the pre-selection processing on TFCS based on the TFCS of the DPCH, the activated DCH, and the length of the input queue of the DCH, thereby to obtain the usable TFCS of each DPCH in the current scheduling period.

In an analogous art Rinne show a priority queuing module for putting a high-priority packets, such as a status PDU of a RLC of the AM, at the front of the input buffer queue of the corresponding DCH; a TFCS pre-selection processing module for conducting the pre-selection processing on TFCS based on the TFCS of the DPCH, the activated DCH, and the length of the input queue of the DCH, thereby to obtain the usable TFCS~~ of each DPCH in the current scheduling period (Rinne, par 0006, 0014, 0015, 0045, 0083, 0123, 0124). The paragraphs show determining priorities of packets of an input buffer of corresponding to a dedicated channel. It is also shown performing TFCS on dedicated channels and length of input queue.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the teachings of Thornton, Paneth, Holma, and Rinne because in order to reduce delay setting priority is needed and the TFCS selection is used to obtain usable TFCS of each channel.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Harley whose telephone number is (571)270-

5435. The examiner can normally be reached on Monday- Friday 7:00 am-4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jefferey Harold can be reached on (571)272-7519. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JH

/Melanie Jagannathan/
Primary Examiner, Art Unit 2468